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Studies on Croatian *Basidiomycota* 2: *Marasmiellus milicae* sp. nov.ARMIN MEŠIĆ¹, ZDENKO TKALČEC^{1*} & VLADIMÍR ANTONÍN²¹*Ruder Bošković Institute, Bijenička 54, HR-10000 Zagreb, Croatia*²*Moravian Museum, Dept. of Botany, Zelný trh 6, CZ-659 37 Brno, Czech Republic*CORRESPONDENCE TO *: amesic@irb.hr, *ztkalcec@irb.hr, vantonin@mzm.cz

ABSTRACT — A new species, *Marasmiellus milicae*, is described from the Mediterranean part of Croatia and compared with similar species. It is characterized by having rather small, white pileus, distinctly to strongly eccentric, curved, short stipe, white hymenophore becoming dark brown when dry, (sub)amygdaloid basidiospores, mostly diverticulate cheilocystidia, pileipellis and stipitipellis with strongly developed Rameales-structure, and gelatinized trama. Color photographs and line drawings of microscopic elements and basidiomata accompany the description.

KEY WORDS — biodiversity, mycobiota, *Omphalotaceae*, taxonomy

Introduction

During the last decade of intensive research of Croatian *Basidiomycota*, a significant number of rare and new species has been found. Some of these have been published in the last few years (Hausknecht et al. 2007; Mešić & Tkalčec 2008, 2009; Tkalčec & Mešić 2008; Tkalčec et al. 2009) and the remaining will be published in a series of papers under the title “Studies on Croatian *Basidiomycota*,” of which this is the second. In the present paper we describe a new species of *Marasmiellus* (*Omphalotaceae*, *Agaricales*) found in the Mediterranean part of Croatia.

Materials & methods

The description of *Marasmiellus milicae* is based on two collections consisting of 27 basidiomata in total. The macroscopic description is based on fresh basidiomata. Microscopic features are described from dried material mounted in potassium hydroxide (KOH) solution and Melzer's reagent, and observed with a light microscope (brightfield and phase contrast – PhC) under magnification up to 1500×. Spore measurements do not include the apiculus. Arithmetic means of spores length and width are shown in italic font in the center of the measurements. The length/width ratio of all measured spores is given as the “Q” value (min. – av. – max.), and the range of arithmetic averages

of “Q” value (Q_{av}) of both collections is also given. The holotype and additional collection are deposited in the Croatian National Fungarium, Zagreb, Croatia (CNF), while an isotype is deposited in the Herbarium of the Moravian Museum, Brno, Czech Republic (BRNM).

Taxonomy

Marasmiellus milicae Mešić, Tkalčec & Antonín, sp. nov.

FIGS 1–10

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Differs from the most similar species by its white pileus; short, eccentric, dark stipe; white hymenophore becoming dark brown when dry; (sub)amygdaloid spores on average $9.1 \times 5.4 \mu\text{m}$; mostly diverticulate cheilocystidia; and strongly developed pileipellis and stipitipellis Rameales-structure.

TYPE: Croatia, island of Mljet (near Dubrovnik), near Prožurska Luka village, $42^{\circ}43'51''\text{N}$ $17^{\circ}38'44''\text{E}$, alt. 60 m, 9 November 2009, leg. M. Čerkez & Z. Tkalčec (Holotype CNF 1/5692, Isotype BRNM 736106).

ETYMOLOGY: Named after Croatian mycologist Dr. Milica Tortić (1920–2008).

PILEUS 6–18 mm broad, hemispherical to convex, margin involute at first, then inflexed to deflexed, slightly crenulate when young, surface smooth to entirely rugose, finely tomentose, white, sometimes with grayish to greenish-gray tinge. **LAMELLAE** adnate, distant, $L = 8\text{--}12$, $l = 0\text{--}2(-3)$, strongly intervenose, especially in larger specimens, sometimes furcate, often $\pm$ sinuous, white with concolorous edge, whole hymenophore becoming dark brown when dry. **STIPE** $1\text{--}3 \times 0.5\text{--}1.2$ mm, distinctly to strongly eccentric, curved in horizontal direction (basidiomata laterally attached to the substratum), cylindrical with slightly broadened apex, insititious, pubescent, white when young, then becoming dark gray to gray-black, sometimes with greenish tinge at the apex. **CONTEXT** concolorous with outer surface. **SMELL** very weak, fungoid when cut.

BASIDIOSPORES $8\text{--}9.1\text{--}10 \times 4.5\text{--}5.4\text{--}6.0 \mu\text{m}$, average = $9.0\text{--}9.3 \times 5.3\text{--}5.7 \mu\text{m}$, $Q = 1.5\text{--}1.70\text{--}1.98$, $Q_{av} = 1.63\text{--}1.73$, mostly (sub)amygdaloid in side view, ellipsoid to fusoid in frontal view, thin-walled, hyaline, apiculus ca. $1.0 \times 1.3 \mu\text{m}$. **BASIDIA** $28\text{--}47 \times 6.0\text{--}10 \mu\text{m}$, 4-spored, clavate. **BASIDIOLES** $15\text{--}45 \times 3.0\text{--}10 \mu\text{m}$, clavate, cylindrical, subfusoid. **LAMELLAR EDGE** heterogeneous. **CHEILOCYSTIDIA** $(10\text{--})13\text{--}60 \times 5.0\text{--}14 \mu\text{m}$, clavate, subcapitate, (sub)cylindrical, fusoid, mostly with simple, branched to coralloid apical projections (digitate, conical, or obtuse) up to $30 \times 5.0 \mu\text{m}$; thin-walled, hyaline. **PLEUROCYSTIDIA** absent. **PILEAL AND HYMENOPHORAL TRAMA** gelatinized, hyphae cylindrical, thin-walled, sometimes branched, up to $10 \mu\text{m}$ wide. **PILEIPELLIS** an ixocutis composed of $\pm$ cylindrical, thin- to slightly thick-walled, smooth or minutely incrustated, diverticulate or smooth, up to $7.0 \mu\text{m}$ wide hyphae; terminal cells and lateral projections up to ca. $20 \times 3.0 \mu\text{m}$, digitate, branched to coralloid, obtuse (well-developed Rameales-structure). **STIPITIPELLIS** a cutis composed



Figs 1–3. *Marasmiellus milicae*. 1. Fresh basidiomata (holotype). 2. Fresh basidiomata (CNF 1/5774). 3. Dried basidiomata (holotype). Bars = 5 mm.

of cylindrical or rarely subinflated, mostly thick-walled [walls up to 1.0(–2.0) μm], smooth or diverticulate, up to 6.0(–15) μm wide hyphae; terminal cells cylindrical to clavate, branched to coralloid, thin- or slightly thick-walled, up to 10 μm wide, some of them with apical, $\pm$ clavate or subcapitate outgrowth. CLAMP CONNECTIONS present and abundant in all tissues. CHEMICAL REACTIONS: all parts of basidioma non-amyloid and non-dextrinoid.

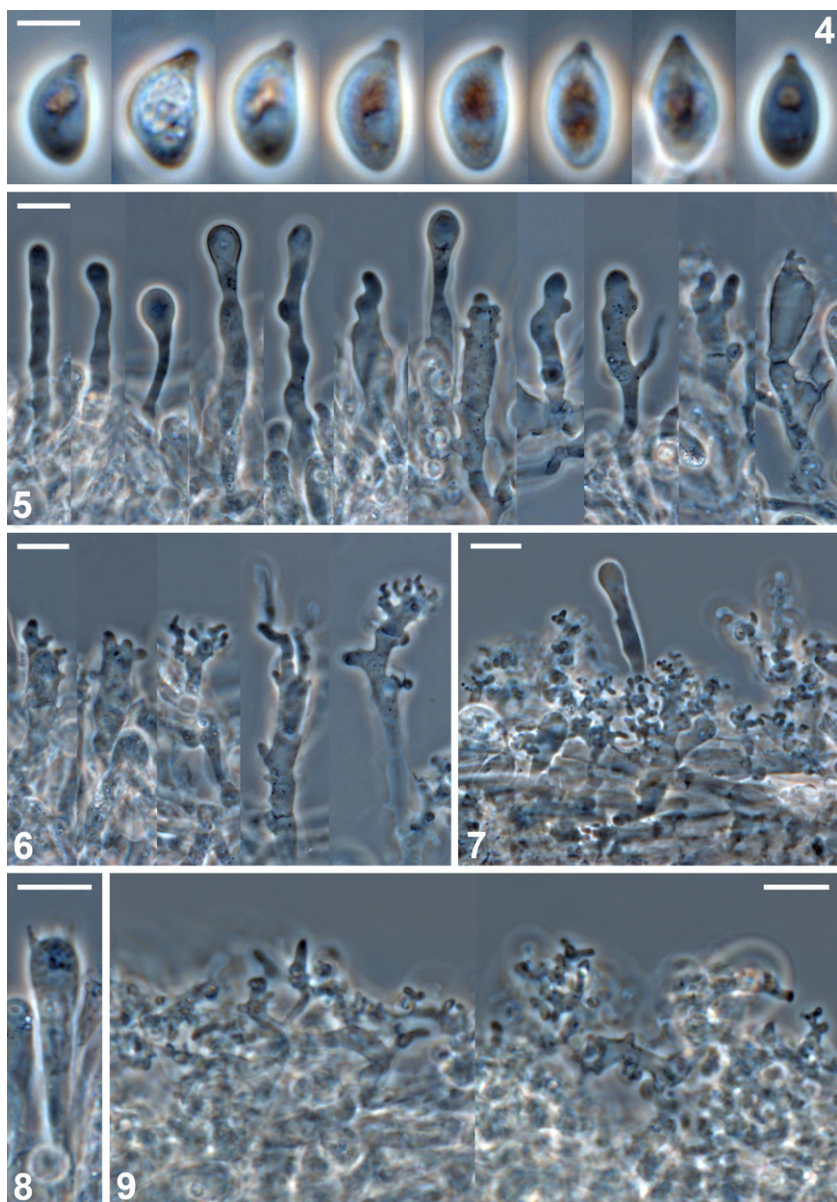
HABITAT — On the type locality in the Mediterranean maquis with *Arbutus unedo*, *Erica arborea*, *Phillyrea latifolia*, *Pistacia lentiscus*, and *Myrtus communis*; on hanging, dead stem of *Lonicera implexa*. On additional locality in evergreen park-forest with *Quercus ilex* and *Laurus nobilis*; on dead stem of *Hedera helix*.

DISTRIBUTION — Known only from two localities in the Mediterranean part of Croatia.

ADDITIONAL SPECIMEN EXAMINED: CROATIA: DUBROVNIK–NERETVA COUNTY, 10 km NW from Dubrovnik, Trsteno arboretum in Trsteno village, 42°42'43" N 17°58'35" E, alt. 55 m, 13 November 2009; leg. M. Čerkez & A. Mešić (CNF 1/5774, BRNM 736107).

REMARKS — *Marasmiellus milicae* is characterized by having a rather small, white pileus, distinctly to strongly eccentric, curved, short, dark stipe, white hymenophore becoming dark brown when dry, (sub)amygdaloid basidiospores, mostly diverticulate cheilocystidia, pileipellis and stiptipellis with strongly developed Rameales-structure, and gelatinized trama. Having those characters, it belongs to sect. *Distantifolii* Singer (Singer 1973). So far, it has been collected only in Croatia.

Several marasmielloid species with similar shape of basidiomata are known in Europe. Among the white colored species, *Gymnopus sphaerosporus* M. Villarreal et al. and *Marasmiellus margaritifer* (Maire) Singer have a white stipe, globose or subglobose basidiospores, and different cheilocystidia (Antonín & Noordeloos 2010). From the white colored species of section *Distantifolii*, *Marasmiellus distantifolius* (Murrill) Singer, known from the USA, Central and South America, especially differs by a pure white stipe, distinctly longer basidiospores ((8.5–)10.2–16 $\times$ 3–5.5(–6) μm according to Singer 1973; 11.5–14.5 $\times$ 4–5.5 μm according to Pegler 1977, 1997), and smaller cheilocystidia (20–25 $\times$ 4.5 μm); *M. corticum* Singer, described from the USA, differs by a shortly radially ferrugineous-brown or ochraceous-brown striped pileus on drying, and smaller ((7–)14–21.5 $\times$ (5–)7–9.5 μm), differently shaped cheilocystidia (Singer 1973). *Marasmiellus afer* Pegler, collected in tropical Africa, has a lateral, rarely absent stipe and narrower (8.2–10.8 $\times$ 3–4 μm), lacrymoid basidiospores (Pegler 1967, 1977). *Marasmiellus tristis* (G. Stev.) E. Horak (= *Campanella tristis* (G. Stev.) Segedin) from New Zealand differs by its pileus turning glaucous or greenish-gray with age, a dirty yellowish hymenophore when dry, spores with lower Q value (1.4), and the absence of



FIGS 4–9. *Marasmiellus milicae* (holotype). 4. Spores. 5, 6. Cheilocystidia. 7. Stipitipellis. 8. Basidium. 9. Pileipellis. All under PhC microscope. Bars: 4 = 5 μ m; 5–9 = 10 μ m.

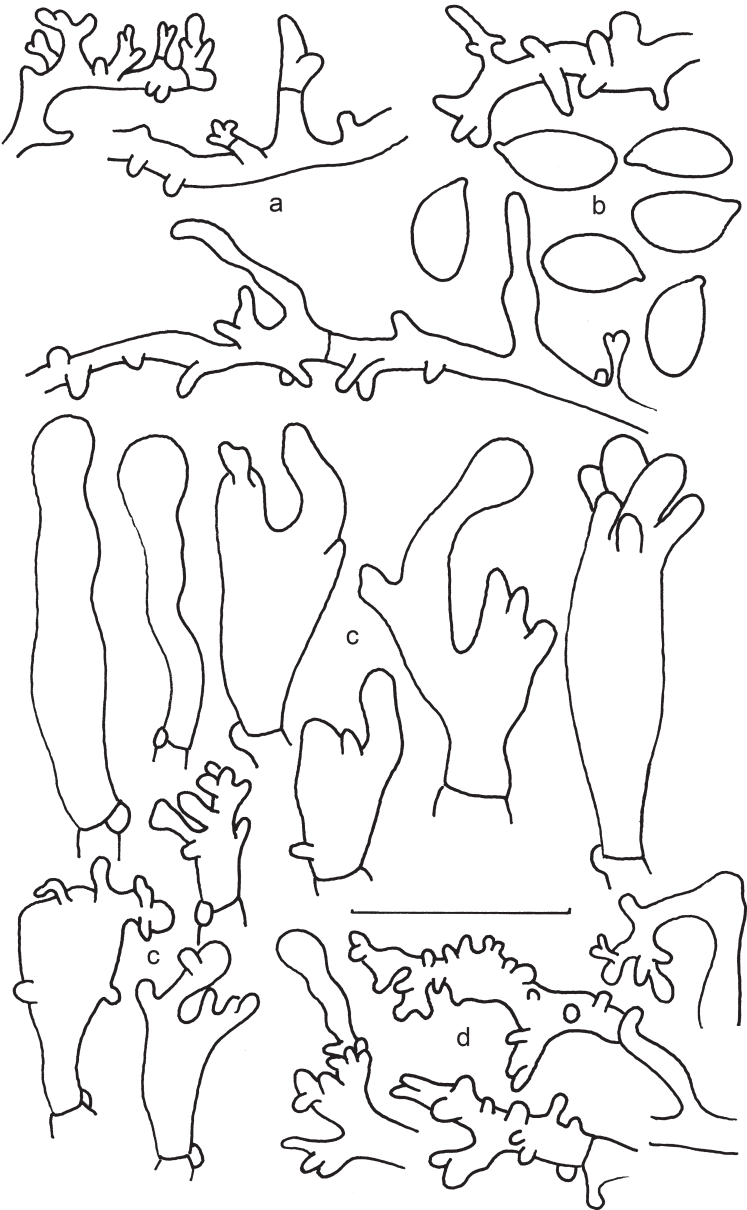


FIG. 10. *Marasmiellus milicae*.

a. Elements of pileipellis. b. Spores. c. Cheilocystidia. d. Elements of stiptipellis. Bar = 20 μ m.

branched or coralloid apical projections on cheilocystidia (Segedin 1993). *Marasmius exillimus* Corner, described from Solomon Islands, has a white, pale fuscous striate pileus, a whitish or pallid fuscous stipe, smaller basidiospores ($5.5\text{--}7.5 \times 3.5\text{--}4\ \mu\text{m}$), and a different pileipellis and stipitipellis (Corner 1996).

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